



# **MOSS Project**

## **Material Off-Shore Sourcing**

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# Presentation Overview

- Problem / Objective / Solution
- Technical Solution Details
- Pilot KR-US
- Cost / Benefit Analysis
- Future Direction



# Problem/Objective/Solution

# Current State Problems

**Communication media are phone, fax, paper and email.**

**Many SCM systems are ad hoc stovepipes composed of EDI, fax, phone and email.**

**Keying and re-keying of data adds time and cost to the process, and introduces errors.**

**Poor visibility into SC events.**

**15% of all ocean containers are delayed en route.**

**79% of data is re-keyed.**

**97% use paper invoices.**

**44% visibility of events.**

**23% visibility at foreign port of lading.**

# MOSS Objective

## If We

- Eliminate Re-keying
- Eliminate paper documents
- Standardize messages
- Harmonize data encoding
- Utilize eDocs

## By

- Creating simple information channels
- Standardize the communication channels between partners
- Utilizing a Trade Collaboration System

## The results will be

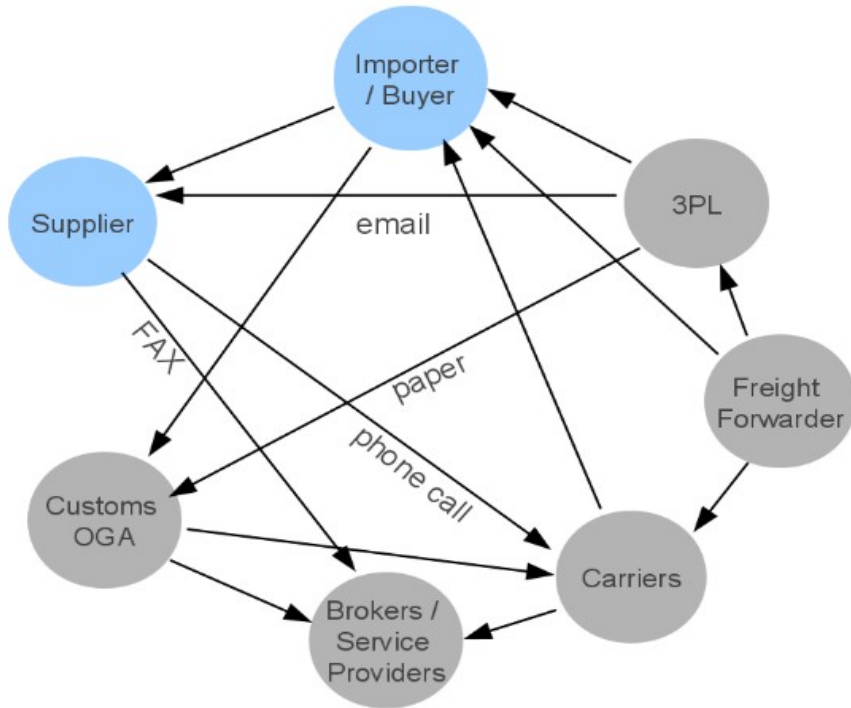
- Reduced transit times
- Reduced buffer stock
- Reduced expediting
- Improved visibility
- Improved compliance
- Reduced errors
- Elimination of low-value work

# Complexities of the Long Distance Supply Chain



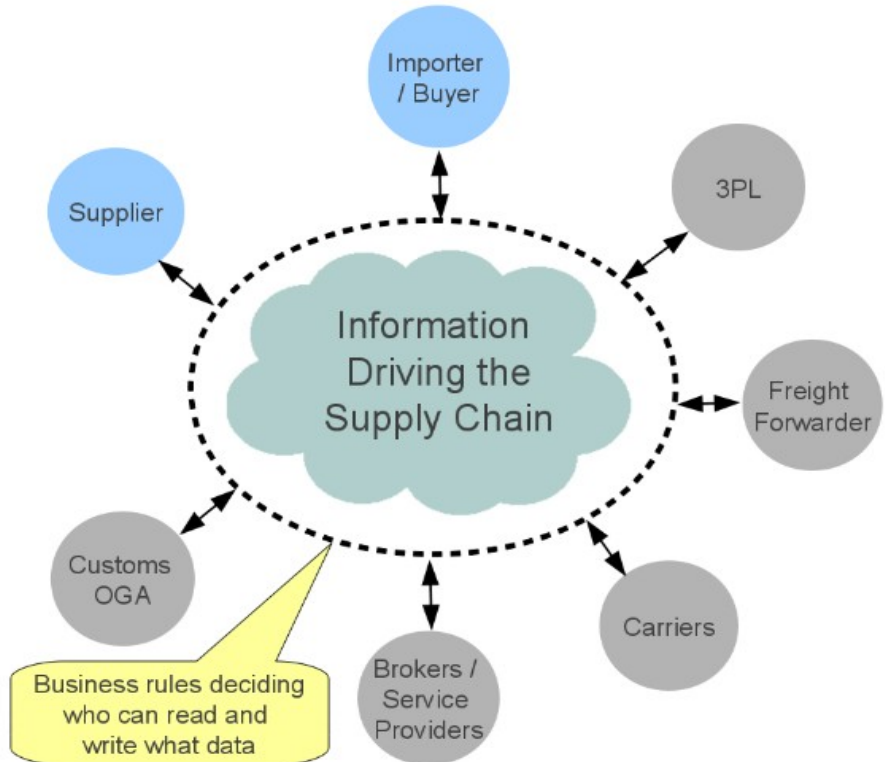
# Technical Solution Details

# MOSS Solution



## *Current Process*

Without MOSS, processes execute as isolated point-to-point communications; information is often obtained second- or third-hand.



## *MOSS Approach*

With MOSS, processes follow a documented flow, and the body of information produced forms a cohesive whole.





**National Institute of  
Standards and Technology**

U.S. Department of Commerce

**Manufacturing Engineering Laboratory**

**Manufacturing Systems Integration Division**

***NIST provides to MOSS technical expertise in developing  
standardized data protocols used in long distance supply chains.***

- ♦ **Developed the MOSS Website at <http://syseng.nist.gov/moss>**
- ♦ **Developing the MOSS Conceptual Model**
- ♦ **Defining MOSS Message Structures**
- ♦ **Developing a MOSS Testbed**

A collection of tools that document the relationships among data used to manage off-shore supply chains

## Contents

### Introduction

[MOSS Views](#)[Reference Views](#)[Repository](#)[Conformance Testing](#)

## Introduction

The **NIST MOSS Project Worksite** is a website developed by [NIST](#) in cooperation with the [Automotive Industry Action Group \(AIAG\)](#) [Materials Off-Shore Supply Chains](#) (MOSS) project. The Worksite provides tools to validate conformance to the MOSS recommendation, and to document the relationships among data used to manage ocean freight supply chains. The MOSS Recommendation is currently in draft form.

Parties involved in the management of ocean freight supply chains include customers and their suppliers, freight carriers (ocean, rail, and road), freight forwarders and other logistics providers, consolidators, customs brokers, customs administrators, and others. The scope of data found on the Worksite includes the data of messages among these parties.

A study motivating the MOSS project ([ppt.odp](#)) identified an excessive use of paper documents, faxing, re-keying of data, and consequentially, the introduction of errors and a loss of shipment visibility. From a perspective on the information involved, current practices fail to identify where transformations of information (rather than simple reuse) are necessary. The MOSS Worksite serves to identify the correspondence of information items across the messages used in the business process.

The sources of data integrated are data in messages relevant to MOSS from [EDIFACT messages](#), the [World Customs Organization Data Set](#) and [UN Trade Data Element Dictionary](#).

[Privacy Notice](#)[Disclaimer](#)[Software Disclaimer](#)

# MOSS Data Matrix

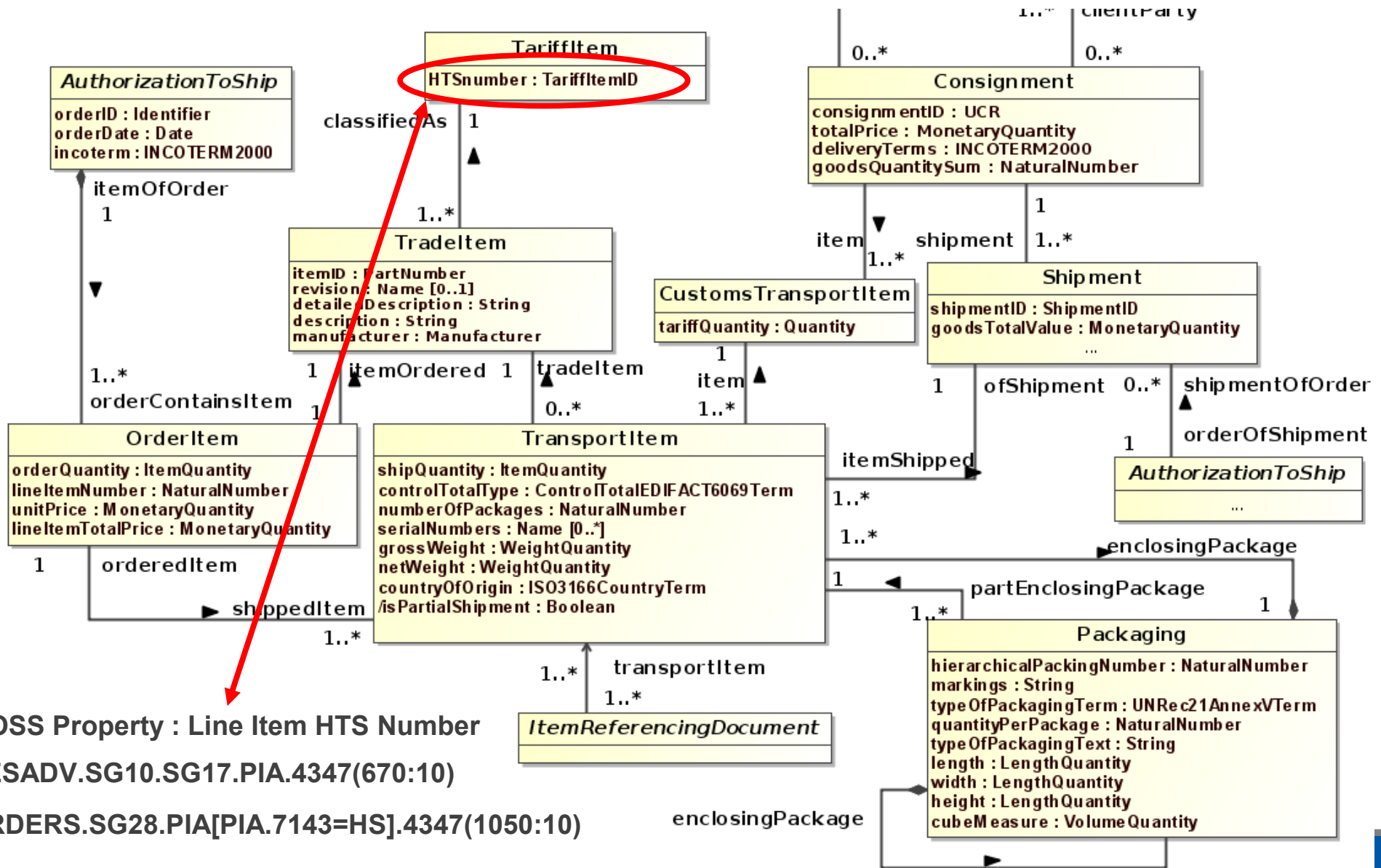
( 220 columns X ~1450 lines ) ... (22 messages X 1450 lines)

Shipment Goods Gross Weight Purpose Code	670	MEA	6311		MEA.6313=AAD:14		AAX	INVOIC.SG14.MEA[MEA.6313=AAD].6311(670:10)	M	AAX
Shipment Goods Gross Weight Attribute Code			6313		MEA.6313=AAD:14	C502	AAD = Gross weight	INVOIC.SG14.MEA[MEA.6313=AAD].C502.6313(670:20:1)	M	AAD
Shipment Goods Gross Weight UOM			6411		MEA.6313=AAD:14	C174		INVOIC.SG14.MEA[MEA.6313=AAD].C174.6411(670:30:1)	M	KG
Shipment Goods Gross Weight			6314		MEA.6313=AAD:14	C174		INVOIC.SG14.MEA[MEA.6313=AAD].C174.6314(670:30:2)	M	8628
Shipment Goods Net Weight Purpose Code	670	MEA	6311		MEA.6313=AAC:14		AAX	INVOIC.SG14.MEA[MEA.6313=AAC].6311(670:10)	C	AAX
Shipment Goods Net Weight Attribute Code			6313		MEA.6313=AAC:14	C502	N = Actual Net Weight	INVOIC.SG14.MEA[MEA.6313=AAC].C502.6313(670:20:1)	C	AAC
Shipment Goods Net Weight UOM			6411		MEA.6313=AAC:14	C174		INVOIC.SG14.MEA[MEA.6313=AAC].C174.6411(670:30:1)	C	KG
Shipment Goods Net Weight			6314		MEA.6313=AAC:14	C174		INVOIC.SG14.MEA[MEA.6313=AAC].C174.6314(670:30:2)	C	10461
Shipment Goods Volume Purpose Code	670	MEA	6311		MEA.6313=ABJ:14		AAX=Consignment Measurement	INVOIC.SG14.MEA[MEA.6313=ABJ].6311(670:10)	M	AAX
Shipment Goods Volume Attribute Code			6313		MEA.6313=ABJ:14	C502	ABJ=Volume Measure	INVOIC.SG14.MEA[MEA.6313=ABJ].C502.6313(670:20:1)	C	ABJ
Shipment Goods Volume UOM			6411		MEA.6313=ABJ:14	C174	MTQ= Cubic Meters	INVOIC.SG14.MEA[MEA.6313=ABJ].C174.6411(670:30:1)	M	MTQ
Shipment Goods Volume Value			6314		MEA.6313=ABJ:14			INVOIC.SG14.MEA[MEA.6313=ABJ].C174.6314(670:30:2)	C	20

EDI Path

Example Data

# MOSS Conceptual Model





# MOSS Pilot KR-US

# Pilot Technology Provider

**The AIAG/MOSS Solution Is Not Proprietary But  
It Is Standard Based Solution That Can Be  
Adopted By Any Company Independent Of The  
Software Or The Service Provider**

- Substantial contribution to the project was made by several software providers. However, TradeMerit was the only software provider to have completed the proof-of-concept conformance testing, which was stipulated as a requirement for participation in the pilot exercise in the role of software provider.

# MOSS Pilot Exercise 1 KR-US FCL

MOSS pilot exercises are experimental deployments of the MOSS solution performed for the purpose of assessing the correctness and effectiveness of the MOSS recommendation, and for fine-tuning the specification.

*Pilot exercises are performed with “live data” run concurrent with existing “production” supply chain processes.*

*Exercise 1* involved a Korean – US supply lane of service part batteries;

- 1,379 shipments per year
- annual purchase volume of \$55 million.
- operates as full-container load (FCL) shipments,
- shipped under Incoterm Free Carrier (FCA) to multiple destinations.
- ocean carrier service “port-to-door” from Busan, Korea to San Pedro, California, to rail into a General Motors (GM) Kansas City, Missouri, warehouse.

The pilot exercise, using MOSS-conforming software from TradeMerit, managed ~20 containers monthly for three months. *Exercise 1* was concluded in July, 2009.

# Pilot Participants

**AIAG – Project Management and Technical Support**

**General Motors Company – SPO, Tax, Purchasing, Logistics**

**TradeMerit – MOSS Conforming SaaS system**

**AtlasBx – KR- Supplier**

**CEVA Logistics – LSP - US and AP offices**

**Eagle/CEVA – Customs Broker**

**DHL – Freight Forwarder - US and AP offices**

**APL – Ocean Carrier**

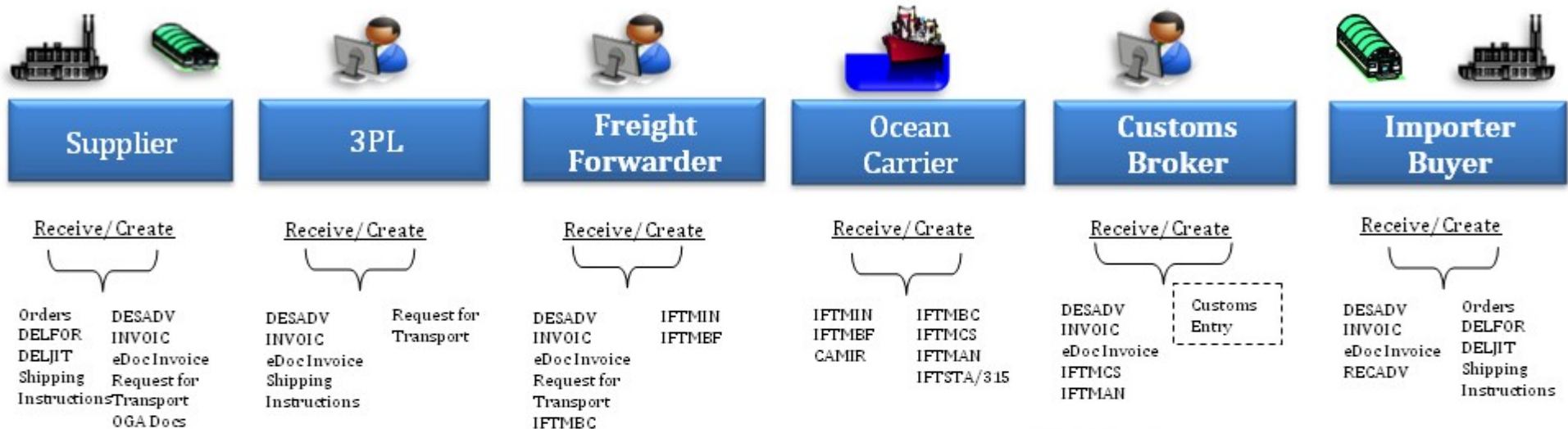
**Menlo WorldWide – Ship-To Party - KC BDC Whse**

**NIST – Conformance testing and technical support**

**Pohang Technical University KR/NIST – Dr. Hyunbo Cho**



# MOSS Pilot Exercises Scope



The TradeMerit trade collaboration system captures data once and then reuses the same data across all messages and trading partners.

The TradeMerit system captures all milestone events from suppliers, carriers and Customs and integrates them into various planning and alert systems.

The TradeMerit system is "Software as a Service". It requires no software installs on Trading Partner systems.

The TradeMerit system looks at the supply chain holistically and optimizes it. This provides a natural synergy with the MOSS objectives.

# Pilot Finding - Reduced Task Counts

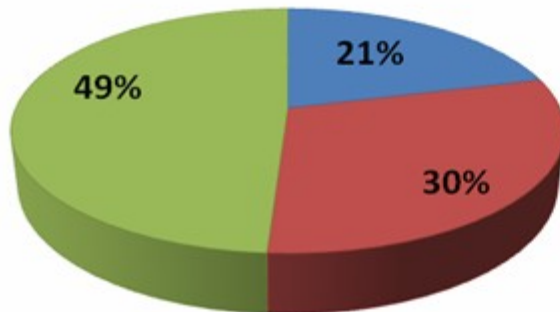
	Current Process	MOSS Pilot*	MOSS Deployment with Full System Integration	Task Kind
Supplier	3	2*	2	Transport Request, ASN, Invoice, OGA Docs
3PL-LSP	5	1*	0-1	Tracking Number
Freight Forwarder	8	3*	2-3	Booking, Instructions, Container Manifest
Ocean Carrier	4	1	1	Booking, BL, AN, Status
Customs Broker	6	2	1	Customs Entry
<b>Total</b>	<b>26</b>	<b>9</b>	<b>6-8</b>	

\*No Email, No Fax. In some cases these tasks require only one data element being entered into the MOSS TradeMerit System.

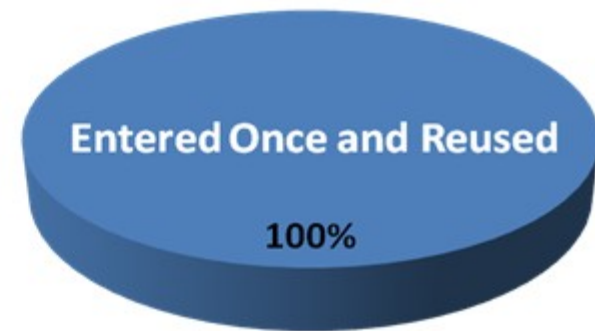
# Pilot Finding - Data Reuse

**Current State**

■ Entered Once and Reused ■ Entered Twice ■ Entered More Than Twice



**MOSS Future State**



- Only 8% of data used in the supply chain needs to be introduced in-process.
- 92% of all SC shipment required data is known prior to movement of the goods.
- Very little information changes from shipment to shipment (e.g. quantity, container #, seal #, sail dates, etc).

# Pilot Finding - Supply Chain Sources of ISF Data

	TradeMerit - TCS	ORDERS	DELFOR	DELJIT	DESADV	INVOIC	IFTMIN	IFTMB
Manufacturer (line item)	Preloaded** from OEM data, confirmed by Shipper	R274 DM*	R274 DM*	R274 DM*	R274 DM	R274 DM		
HTS (line item)	Preloaded** from OEM data	R804 DM	R804 DM	R804 DM	R804 DM	R804 DM		
G/O (line item)	Preloaded** from OEM data, confirmed by Shipper	R704 DM	R704 DM	R704 DM	R704 DM	R704 DM		
Seller	Preloaded** from OEM data,	R68 DM	R68 DM	R68 DM	R68 DM	R68 DM	R68 DM	R68 DM
Buyer	Preloaded** from OEM data	R244 DM	R244 DM	R244 DM	R244 DM	R244 DM		
Ship To	Various are Preloaded** from OEM data, confirmed by Shipper	R5 DM	R5 DM	R5 DM	R5 DM	R5 DM	R5 DM	R5 DM
Container Stuffing Location	Shipper				R 727 DM	R 727 DM		
Consolidator	Preloaded** from OEM data, confirmed by Shipper				R 53 DM		R 53 DM	
Imported Data Matrix	Preloaded** from OEM data	R257 DM	R257 DM	R257 DM	R257 DM	R257 DM		
Consignee #	Preloaded** from OEM data,	R 167 DM	R 167 DM	R 167 DM	R 167 DM	R 167 DM		

\*\* Preloaded from OEM includes Order, Schedule and General Shipping Instructions.

# Future State Solution

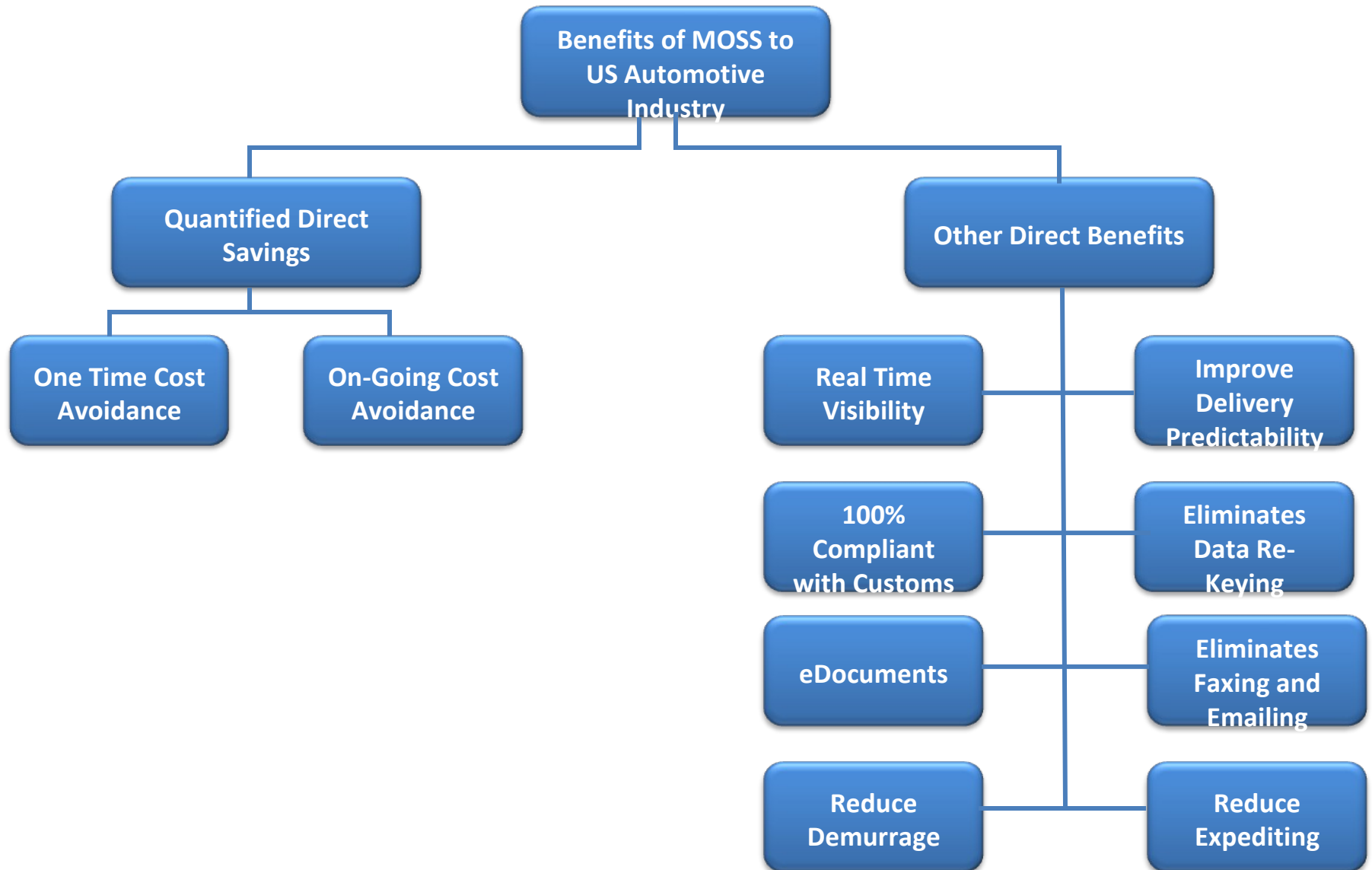
- The Pilot demonstrated that the error-prone, low value tasks common to the operation of most supply chains – the re-keying of data, the emailing and faxing of documents - can be eliminated
- In the Pilot, there was no re-keying – data was entered once and then reused as necessary by authorized supply chain trading partners
- In the Pilot, there was no faxing or emailing documents – all documents were either imaged paper documents or system-controlled documents (eDocs)
- In the Pilot, milestone reporting was real time
- In the Pilot, data was entered once into the TradeMerit Trade Collaboration System (TCS) and reused as necessary by authorized trading partners.



# **MARSH**

## **CBA – Cost / Benefit Analysis**

# MOSS Benefits



## Study Findings – Affect on the Industry

	Pilot	OEM	Industry
Import Value	\$55M	\$1.3B	\$52B
Reduced Inventory	\$0.733M	\$19.95M	\$691.6M
Avoided Transportation Cost	\$29K	\$795K	\$27.56K
Avoided Customs	\$22K	\$510K	\$17.68M
Sub Total	\$0.785M	\$21.25M	\$738.84M
Reduced Buffer	\$1.06M	\$28.65M	\$932.2M
Total	\$1.85M	\$49.9M	\$1.73B

**This represents a saving of 3.33% of total import value**



# Investment Analysis – Pilot KR-US

	Year			
	0	1	2	3
Initial Cash Investment	-\$32,000	0	0	0
Cash Inflow (one time savings)	+\$1,800,000	0	0	0
Cash Outflow (recurring costs)	0	-\$95,000	-\$95,000	-\$95,000
Cash Inflow (recurring savings)	0	+\$392,000	+\$392,000	+\$392,000
<b>Net Cash Flow</b>	<b>+\$1,768,000</b>	<b>+\$297,000</b>	<b>+\$297,000</b>	<b>+\$297,000</b>

# Investment Analysis – Pilot Lane KR-US

## UNIT

*represents 1 day of transit reduction  
and 1 day buffer reduction*

*Note: this investment analysis does not include the one-time benefit of freed working capital of \$ 313,511.*

Initial Investment	\$ 32,000.
Recurring Cost	\$ 95,000.
Recurring Savings	\$ 228,000.
Net Cash Flow	\$ 133,000.
Net present Value (NPV)	= \$ 323,000.
Internal Rate of Return (IRR)	= 413%
Payback period	= 2.9 months

## PILOT

*represents 4.85 days of transit  
reduction and 7 day buffer reduction*

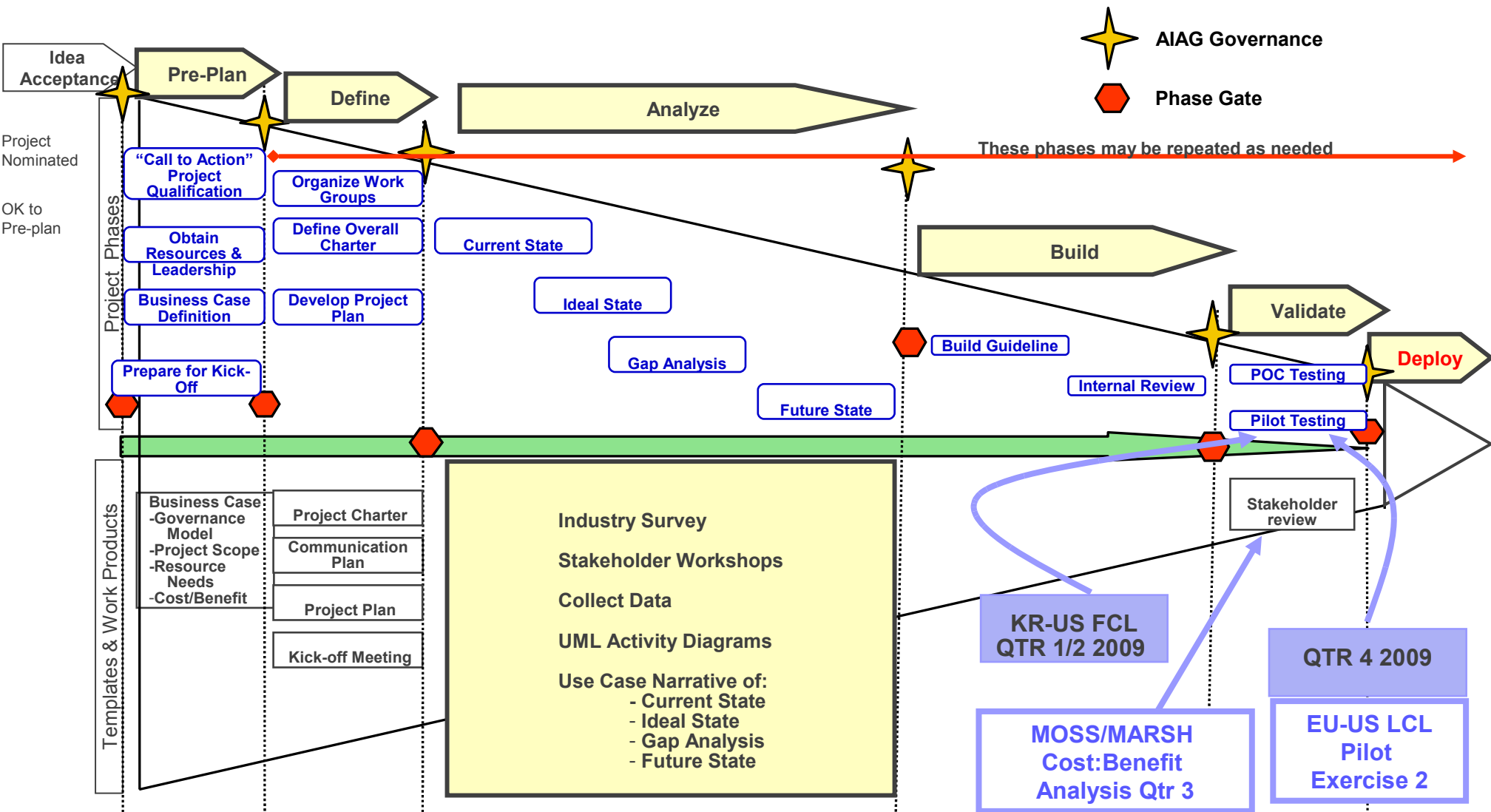
*Note: this investment analysis does not include the one-time benefit of freed working capital of \$1,844,903.*

Initial Investment	\$ 32,000.
Recurring Cost	\$ 95,000.
Recurring Savings	\$ 392,000.
Net Cash Flow	\$ 297,000.
Net present Value (NPV)	= \$ 761,886.
Internal Rate of Return (IRR)	> 413%
Payback period	= 1.3 months



# Future Direction

# AIAG Project Management Process



# MOSS Deliverables

- **Cost Benefit Analysis**
- **Recommended Best Practices**
- **Technical Requirements**
- **TradeMerit Case Study**

# MOSS Contact Information

<b>AIAG</b>	<b>Morris Brown, Program Manager (<a href="mailto:mbrown@aiag.org">mbrown@aiag.org</a>)</b>
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**Thank you. Questions?**